

693.5
LIBRARY
THE FRANKLIN INSTITUTE

JUN 23 1921

*Making poor concrete floors good
and
good ones better*

GENERAL CHEMICAL COMPANY
25 BROAD STREET, - NEW YORK, U.S.A.

A. I. A. Standard Classification Number 3 b 2.

FLUOSILICATES *for* HARDENING CONCRETE

ALUMINUM, zinc and magnesium fluosilicates were first used in Europe over thirty years ago for hardening disintegrating limestones. The chemists then figured that since Portland cement is principally lime, why not apply these fluosilicates to concrete. Success in this field was even more marked.

Today, after extensive chemical and physical research, the General Chemical Company offers to the architect, the engineer and the builder what it firmly believes to be the most efficient combination of the silico fluorides, trademarked **HARD-N-TYTE**.

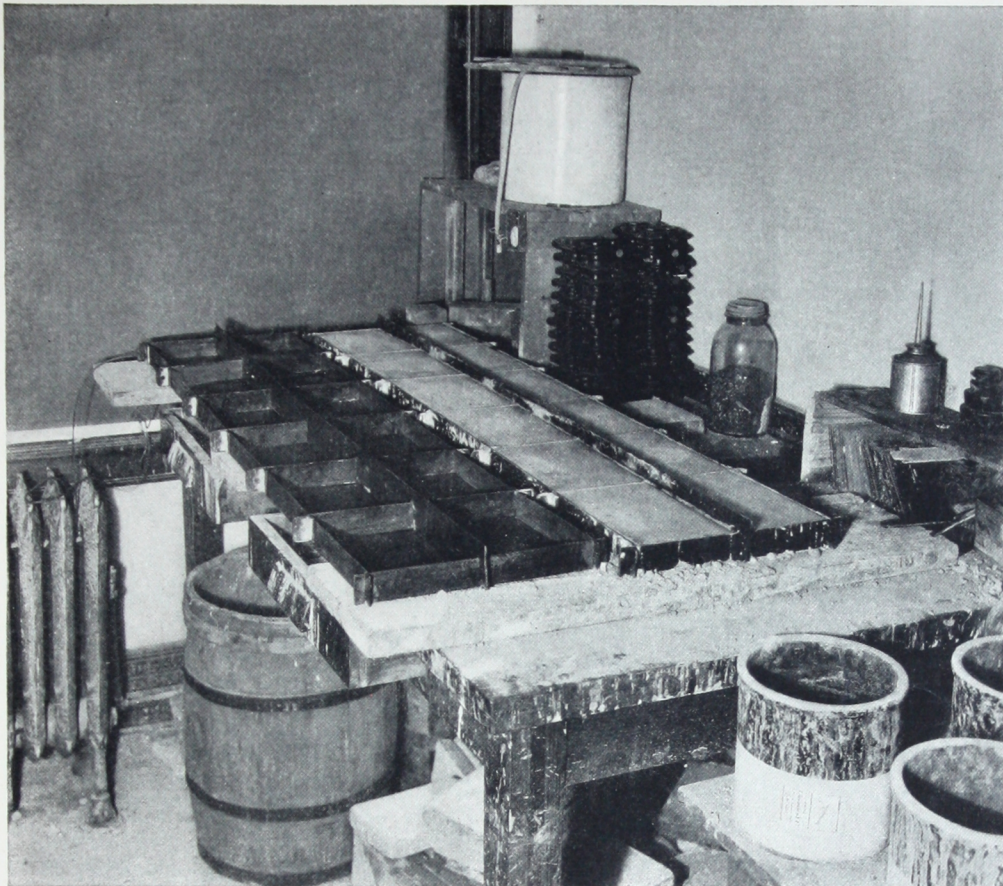
Water and mystery have been removed—one to save freight; the other to establish confidence. The pure white crystals of zinc and magnesium fluosilicates are dissolved in water and flushed over the concrete floor. The results speak louder than we can.

GENERAL CHEMICAL COMPANY

25 BROAD STREET
NEW YORK, U. S. A.



Branch Offices: Baltimore, Buffalo, Chicago, Cleveland, Denver, Easton, Montreal, Philadelphia, Pittsburgh, Providence, San Francisco, Seattle



One corner of a practical laboratory designed for testing concrete wearing surfaces. Concrete floor hardeners are here given the "acid test."

**What is
HARD-N-TYTE?**

HARD-N-TYTE is the registered trade name given to pure white crystals of magnesium and zinc fluosilicate. Only after extensive research was this combination decided upon as the most efficient chemicals for hardening and densifying portland cement concrete.

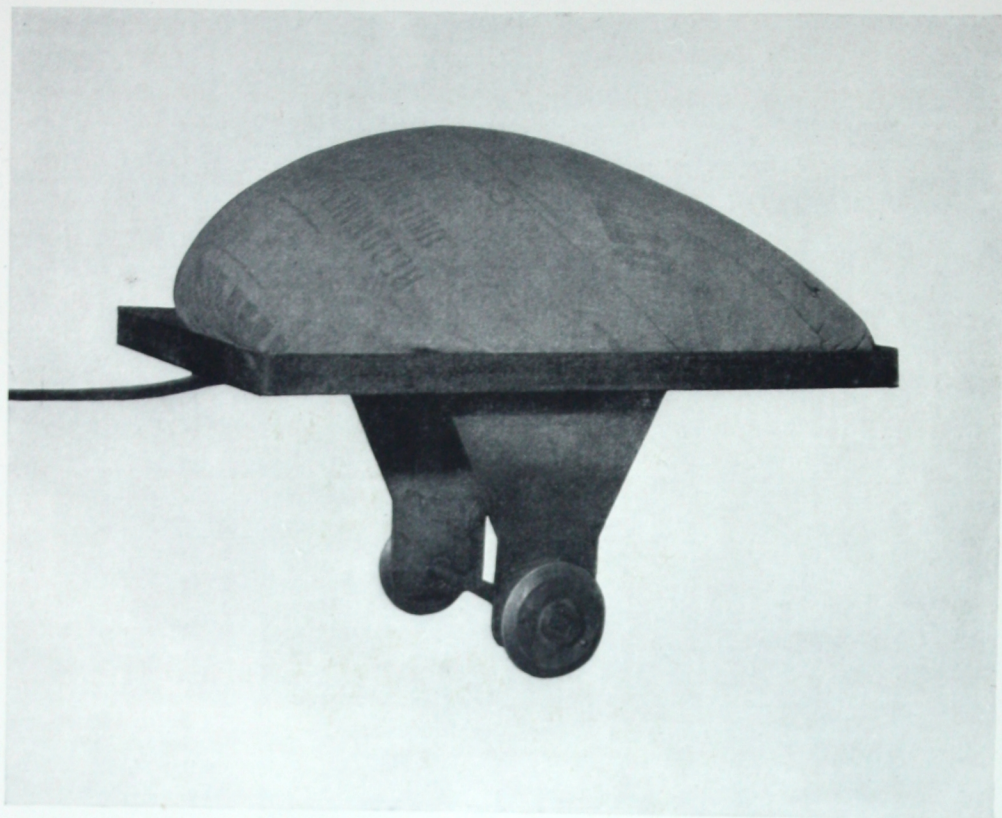
What is it for?

When dissolved in water and applied to concrete, HARD-N-TYTE penetrates and hardens the surface to such an extent that even under intensive wear and trucking conditions the particles of concrete are not dislodged. Combining with the hydrated cement, an insoluble fluoride like fluorspar is formed, not only binding the particles of aggregate together but itself able to resist heavy wear.

How is it different?

HARD-N-TYTE, instead of a liquid, is crystalline in form. Comparatively small space is required for storage. No barrels to leak, no absorption by the wood, and no evaporation. Easily soluble in water.

Especial emphasis is placed on the application of HARD-N-TYTE to the concrete surface after placing. Various integral



Concrete floor test specimens subjected to action of machine illustrated are given several years wear in as many minutes.

How is it different?

preparations have been recommended and marketed for hardening concrete. The majority of these are water solutions of calcium chloride. While the ability to mix with the concrete is a construction advantage, the results obtained in the laboratory more than justify the application of HARD-N-TYTE after the floor has been placed.

Marketed with a reputation.

Over twenty years of successful manufacturing and marketing of standard chemicals is behind HARD-N-TYTE. Whether filling tank cars with sulphuric acid for the steel industry, or making reagent chemicals for the research laboratory, the General Chemical Company stands squarely back of its products.

Service.

Application of HARD-N-TYTE is so simple that no especial service is required. Anybody can apply HARD-N-TYTE crystals successfully if he will follow the simple directions given later. For special problems, engineers with a wide experience in concrete construction are available. Of especial importance is the production of a good concrete wearing surface at the start. Treated with HARD-N-TYTE such a floor will wear like mosaic under the heaviest conditions.

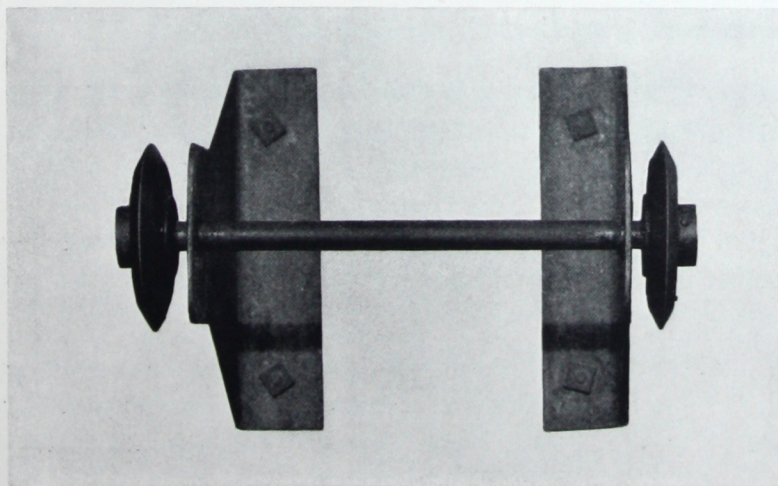
**Application Based
on Tests and
Practice.**

Formerly, recommendations for the application of fluosilicate floor hardeners have been based largely on the fact that if any amount would be good, more must be better. In the laboratory, this subject was thoroughly investigated by practical concrete engineers using hundreds of floor slabs for the purpose. These were treated with every practicable concentration, and in number of applications up to five. After all these tests were analyzed, the fundamental principle was established that after a certain amount of HARD-N-TYTE had been applied, more was wasted. The applications recommended are therefore not only the most efficient but the most economical. Applications on floors in service have approved the findings in the laboratory.

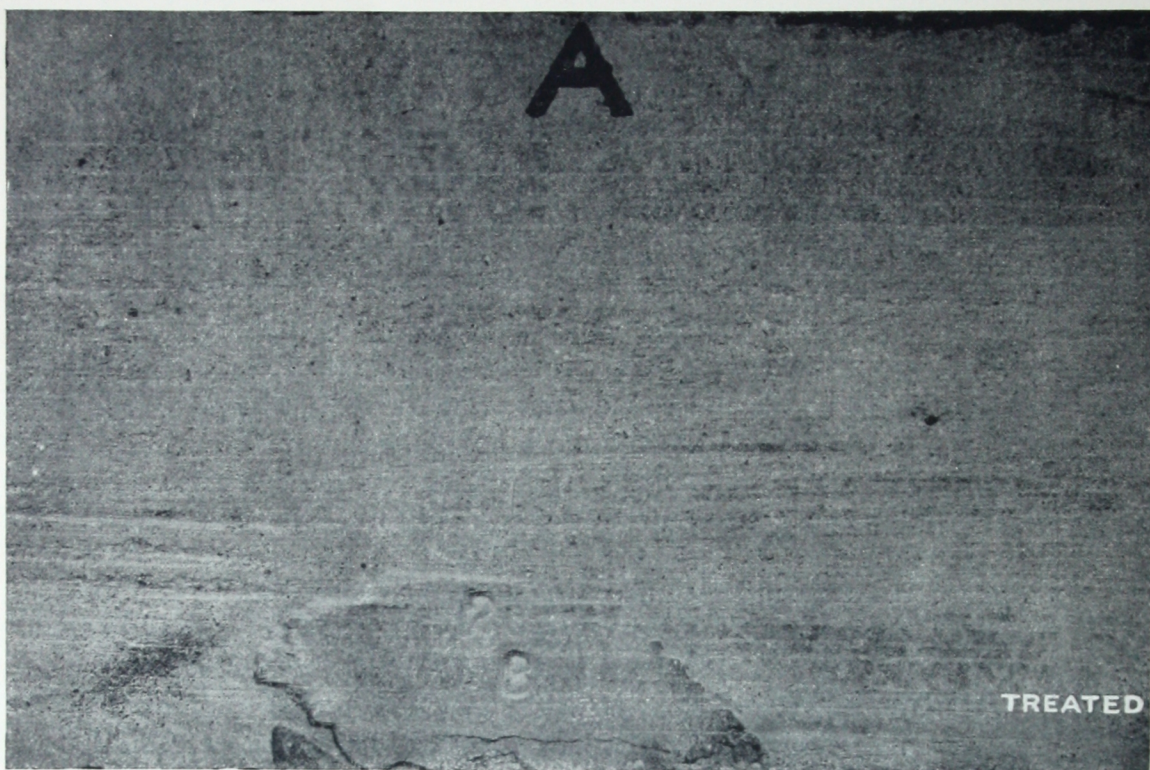
**Special Testing Machine
Used**

No testing machine being in the market for determining the effect of intensive wear on concrete floors, the General Chemical Company engineers adopted the one illustrated. Wheels are of case-hardened steel sharpened to an angle of about thirty degrees to the vertical. Cart weighs 35 lb. and the added weight, 50 lb., total 85 lb. Eight slabs were tested at one time by running the cart back and forth 600 trips. Half of the slabs were plain, and the others treated with various concentrations and numbers of applications.

Studies were also made of the behavior of concretes of different consistencies, mixtures and aggregates under these treatments, the best age at which to apply HARD-N-TYTE and the minimum period between applications. Deductions were only made after the averages of a number of slabs could be used, in some cases running over one hundred for one concentration.



Case-hardened steel wheels.
Detail of machine illustrated
on opposite page.



Laboratory Test Data.

These series of tests were made for two purposes: First, to confirm previous reports on the high value of the silico fluorides for hardening concrete. Second, to determine the most economical application in amount of HARD-N-TYTE used and number of applications consistent with maximum wear-resisting ability.

The results of these tests have been very conclusive. They have indicated that among all the chemical agents recommended for hardening concrete, the fluosilicates stand at the top. They indicate that HARD-N-TYTE gives the greatest resistance to wear with a minimum of material.

This is accomplished by making the first application comparatively weak so as to insure the maximum penetration. Following with the concentrated solution insures that all of the lime available has been changed into flint-like material, which not only binds the particles of the aggregate together but stands up for its own share of heavy duty.

Painting Concrete Surfaces.

Where uniformity and color are particularly desired, the painting of concrete floors is recommended. This should not be done without first applying HARD-N-TYTE, for the following reasons:

Which Concrete do you want?

HERE are illustrated the results of the use of HARD-N-TYTE on concrete floors. Both were treated with HARD-N-TYTE. One was treated with HARD-N-TYTE. The other was treated with HARD-N-TYTE. You can see the results of the use of HARD-N-TYTE. The results show that HARD-N-TYTE is the best way toward making concrete unless it is HARD-N-TYTE.

Treat your concrete floors with HARD-N-TYTE. Treat new, and avoid disintegration. You can see the results of the use of HARD-N-TYTE. The expense is nothing compared with the life.

Concrete Floor You want?

strated two slabs of Port-
nt top mortar, both same
anship, mixture and con-
were tested under the
of sharp case-hardened
ipitate the action of
long periods.

with HARD-N-TYTE—pure
magnesium and zinc fluo-
ing to our recommenda-
her slab was untreated.
he results. One is still
eel, and the other is on
making a bad reputation
unless it is treated with

crete floors while they're
disintegration. We'll tell
expense doesn't amount
pared with the increased



Painting Concrete Surfaces.

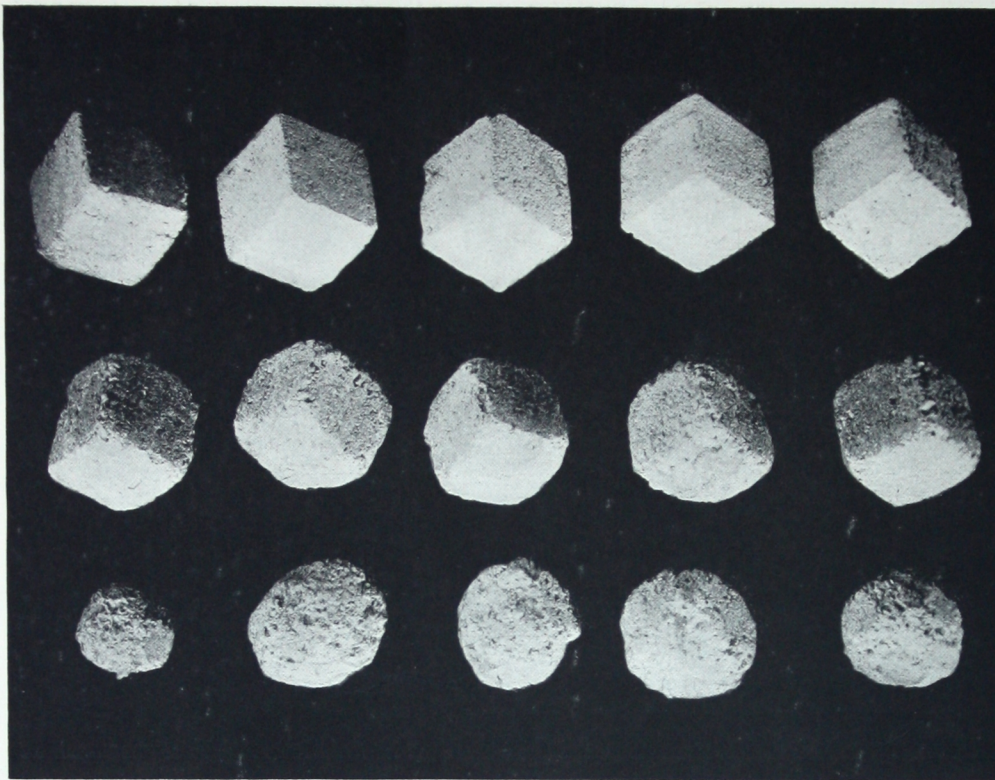
First: Under traffic there is a tendency for the concrete surface to soften below the paint skin. When this condition occurs the paint disintegrates, leaving worn and unsightly spots which more paint cannot possibly repair. Second: Good floor paints containing linseed oil saponify by combining with the free lime in the concrete. The result of this action can be seen in the photographs published on page 9.

HARD-N-TYTE prevents disintegration under the paint skin by hardening and densifying the surface. Treatment makes paint go farther, since less is absorbed by the concrete.

When wear occurs the paint only is abraded. Worn spots can easily be painted over, since the concrete is perfectly sound below.

No Special Paints Required.

HARD-N-TYTE can be used as a priming coat for any concrete surface. For exterior stuccos, interior cement plaster, in fact upon any surfaces where Portland cement has been used, HARD-N-TYTE is desirable. For such purposes, only one application is necessary, proportioned two lb. HARD-N-TYTE crystals to one gallon of water.



Bottom row shows effect of rattling five untreated cement mortar cubes together. Middle row shows reduced wear due to HARD-N-TYTE application. Top row shows cubes before test.

No Special Paints Required.

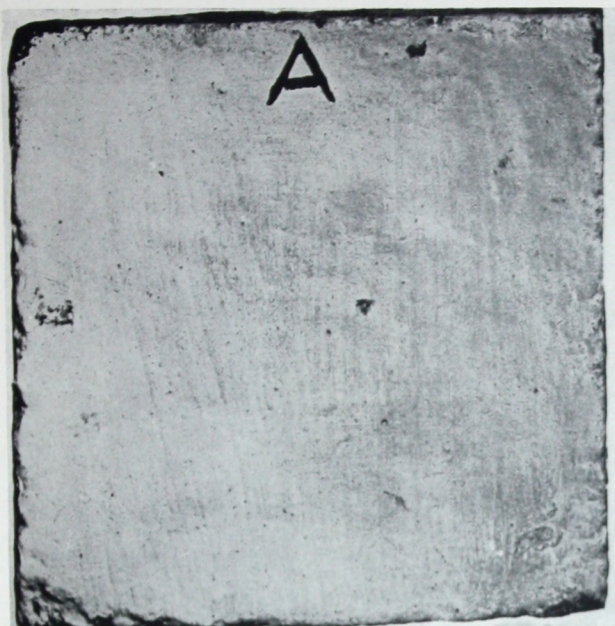
Because HARD-N-TYTE neutralizes the free lime in the mortar surface any standard floor paint can be applied as soon as the surface is dry. No need to worry about softening—no need for special or “technical” paints.

General Directions.

HARD-N-TYTE is readily soluble in water, but care should be taken that it is thoroughly dissolved before applying. For all practical purposes, a heaping pint measure will equal one pound. (See page 11 for methods of measuring.)

For normal conditions, two and one-half pounds of HARD-N-TYTE will cover about 100 square feet, two applications. This will vary with the porosity of the floor. It is a good plan to give a floor all it will take up readily, even going back over porous spots, where absorption is more rapid.

In this manner the surface is made to wear uniformly irrespective of irregularities in placing the mortar or method of finishing.



Above are unretouched photographs of two specimens of cement mortar painted with linseed oil white lead paint. After thoroughly dry, both were immersed in water for 72 hours. The sample on the left was first treated with a 2-lb.-to-1-gallon of water solution of HARD-N-TYTE. There was consequently no action between the lime and the paint.

Specification Wearing Surfaces

All exposed concrete wearing surfaces, such as floors and stair treads shall be treated with General Chemical Company HARD-N-TYTE as follows:

First Application: One half ($\frac{1}{2}$) lb. HARD-N-TYTE dissolved in one gallon of water.

Second Application: (After first application has dried, but not sooner than thirty minutes). Two (2) lb. HARD-N-TYTE dissolved in one gallon of water.

Concrete wearing surface shall be at least forty-eight (48) hours old before first application. Solution shall be evenly distributed over the areas to be treated, and all surfaces shall be kept wet with the solution for at least three (3) minutes, each application. All HARD-N-TYTE used shall be delivered in the original packages, and delivery based on one lb. HARD-N-TYTE crystals for each forty (40) square feet of concrete floor to be treated.

Specification Priming Coat

All Portland cement plaster and concrete surfaces shall be treated before painting with a priming coat composed of two (2) lb. General Chemical Company HARD-N-TYTE, dissolved in one (1) gallon of water. Application shall be made when the concrete or plaster is not less than twenty-four (24) hours old. Surfaces shall be kept drenched with the solution for at least three (3) minutes. Paint shall not be applied until the HARD-N-TYTE treatment has thoroughly dried, and in no case before forty-eight (48) hours have elapsed.



Sharpless Hendler
Ice Cream Plant at
Wilmington, Del.
See letter below from
Manuel Hendler,
President.

Satisfied Users.

The number of satisfied HARD-N-TYTE users increases daily. The following letter received from Manuel Hendler, President of the Hendler Creamery Company, Baltimore and Wilmington, is typical of many:

"We have used successfully the concrete hardener manufactured by your company, designated HARD-N-TYTE.

"This product has been used on the concrete floors and side walls of our ice storage and cream storage rooms, and in fact in all of the different departments of our plant. We can recommend it for hardening the surfaces of the concrete to such an extent that practically all dusting and disintegration have been prevented. This must necessarily prolong the life of the concrete materially. The floors become much smoother, which enables us to clean and wash them more easily."

Let us help you!

Application of HARD-N-TYTE is simple. Building a good concrete floor in the beginning is the difficult job. If our engineers can assist you in your concrete specifications, their services are yours. HARD-N-TYTE makes poor concrete floors good, and *good* ones better. We are at your disposal.

Write nearest Office

GENERAL CHEMICAL COMPANY

25 BROAD ST., NEW YORK, U.S.A.

BRANCH OFFICES:

BALTIMORE
BUFFALO
CHICAGO

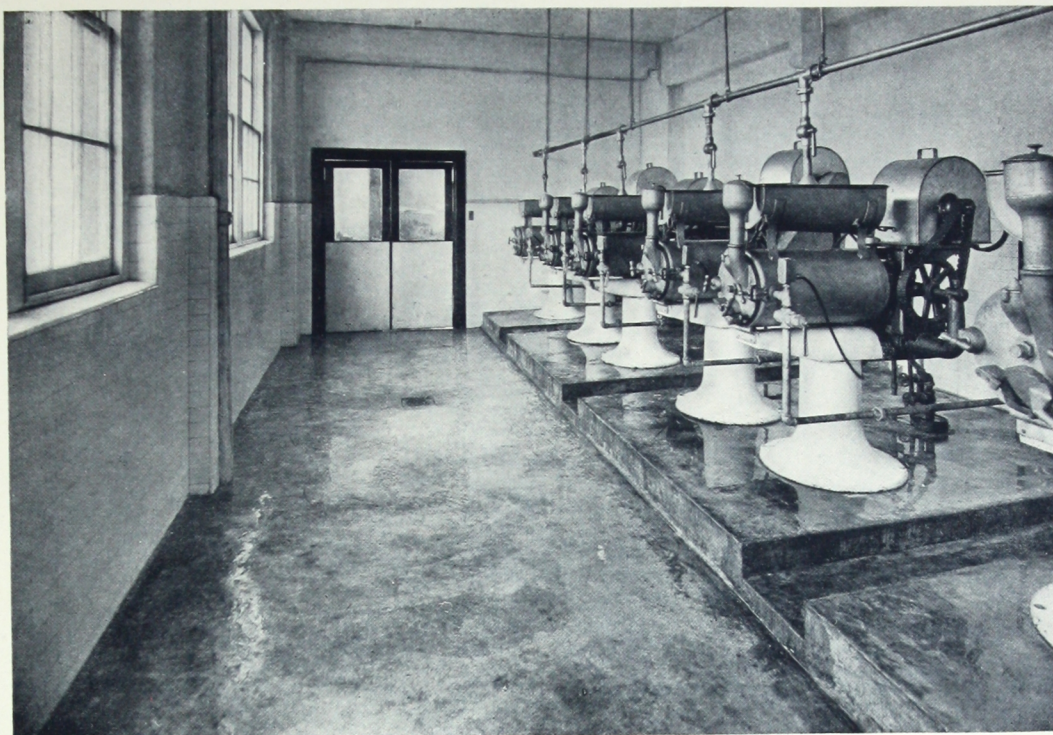
CLEVELAND
DENVER
EASTON

PHILADELPHIA
PITTSBURGH
PROVIDENCE

SAN FRANCISCO
SEATTLE

CANADIAN REPRESENTATIVE:

NICHOLS CHEMICAL COMPANY, LTD., MONTREAL



Interior of the plant shown opposite. All floors and cement plaster walls treated with HARD-N-TYTE.

Methods of Measuring HARD-N-TYTE.

BY WEIGHT

	HARD-N-TYTE	WATER
First application.....	1/2 lb.	1 gallon
Second application.....	2 lbs.	1 gallon

BY MEASURE

	HARD-N-TYTE	WATER
First application.....	one heaping pint	2 gallons
Second application.....	one heaping pint	1/2 gallon

BY VOLUME

	HARD-N-TYTE	WATER
First application.....	one part	13 parts
Second application.....	three parts	10 parts

For example, when measuring HARD-N-TYTE by volume for the first application, take one level pail of HARD-N-TYTE crystals, measuring loosely, and 13 pails of water.

Volumes and dimensions of standard galvanized pails are as follows:

Gallons	Top Diameter	Bottom Diameter	Depth
2	9 1/2"	7 1/2"	8"
2 1/2	10 1/2"	8 1/2"	8 3/4"
3	10 3/4"	8 1/2"	9 3/4"
3 1/2	11 1/2"	9 1/4"	10 1/4"
4	12"	9"	11"

HARD-N-TYTE solutions can be flushed on concrete floors from pails or sprinkling cans and distributed with long-handled floor brushes.



*Makes poor concrete floors good
and good ones better*

WILBERT GARRISON CO.
DESIGNERS & PRINTERS
NEW YORK CITY